Inter-comparison of CHARM Data and WSR-88D Storm Integrated Rainfall

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ABSTRACT

A localized precipitation network has been established over a 4000 km^2 region of northern Alabama in support of local weather and climate research at the Global Hydrology and Climate Center (GHCC) in Huntsville. This Cooperative Huntsville-Area Rainfall Measurement (CHARM) network is comprised of over 80 volunteers who manually take daily rainfall measurements from 85 sites. The network also incorporates 20 automated gauges that report data at 1-5 minute intervals on a 24 h a day basis. The average spacing of the gauges in the network is about 6 km, however coverage in some regions benefit from gauges every 1-2 km. The 24 h rainfall totals from the CHARM network have been used to validate Stage III rainfall estimates of daily and storm totals derived from the WSR-88D radars that cover northern Alabama. The Stage III rainfall product is produced by the Lower Mississippi River Forecast Center (LMRFC) in support of their daily forecast operations. The intercomparisons between the local rain gauge and the radar estimates have been useful to understand the accuracy and utility of the Stage III data.

Recently, the Stage III and CHARM rainfall measurements have been combined to produce an hourly rainfall dataset at each CHARM observation site. The procedure matches each CHARM site with a time sequence of Stage III radar estimates of precipitation. Hourly stage III rainfall estimates were used to partition the rain gauge values to the time interval over which they occurred. The new hourly rain gauge dataset is validated at selected points where 1-5 minute rainfall measurements have been made. This procedure greatly enhances the utility of the CHARM data for local weather and hydrologic modeling studies.

The conference paper will present highlights of the Stage III intercomparison and some examples of the combined radar / rain gauge product demonstrating its accuracy and utility in deriving an hourly rainfall product from the 24 h CHARM totals.